PATENT

KL-US050678

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : ***Confirmation No. 7520***

Kazumasa Fukazawa et al. :

Serial No. 10/681,253 :

Filed: October 9, 2003 :

For: BULLDOZER WITH IMPROVED VISIBILITY (As Amended) :

DECLARATION OF MASAYUKI MUKAINO UNDER 37 CFR §1.132

I, Masayuki Mukaino, pursuant to 37 CFR §1.132, hereby declare:

1. I am a co-inventor of the invention disclosed in the above-identified application.

2. I am currently a general manager of Small Size Machine Development Group of Komatsu Ltd in Japan. I have been working as an engineer in the construction equipment manufacturing field for the past 27 years. Therefore, I believe I possess experience, skill and knowledge of what one of ordinary skill in the construction equipment manufacturing field would possess.

3. Attached hereto is Exhibit A that shows comparison of front visibility between the Komatsu D51-22 bulldozer having the claimed features and several conventional bulldozers A to D. In the conventional bulldozers, visibility of the front portion of the bulldozer from the cab is substantially blocked by a large engine hood. As shown in Figs. 1-3, 1-4, 2-3, 2-4, 3-3 and 3-4 of Exhibit A, in the conventional bulldozers, a center portion of the blade is completely hidden behind the engine hood, which covers a cooling module of the bulldozer, as viewed from inside of the cab. Therefore, an operator seating on the operator seat inside the cab could only see the transverse edges of the blade. To my knowledge, there has never been a bulldozer that allows the operator to see the top center portion of the blade.

4. The fact that the operator cannot see the top center portion of the blade can cause various problems in the conventional bulldozers. For example, the operator may not be able to see objects lying on the ground (e.g., finishing stakes, pickets, drainage ditches, manholes, etc.) when the bulldozer is used in a construction site or the like. Moreover, since the visibility of the blade is completely divided at the center portion of the blade by the engine hood and the operator can only see very limited areas of the transverse edges of the blade, it becomes even more difficult to ascertain the situation ahead when the angle of the blade is changed as shown in Figs. 1-4, 2-4 and 3-4. Although Figs. 1-4, 2-4 and 3-4 only show the case in which the blade is angled, the same problem (e.g., it is difficult to ascertain the situation ahead) occurs when the blade is tilted in the conventional bulldozers. When the bulldozer is used for leveling the ground, the operator needs to frequently perform tilting operation of the blade. Thus, when operating the conventional bulldozer, the operator must always estimate the information that is not visually available due to the existence of the large engine hood, such as location and orientation of the blade and condition of the ground in front of the blade, based on his or her experience. It usually takes a long time for an inexperienced operator to learn this skill.

5. Although the problems stemming from not being able to see the top center portion of the blade had been recognized in the conventional bulldozers, the solution to those problems was considered to be unavailable in view of the structural/design limitations of the bulldozer. In the conventional bulldozers, the cooling module including the radiator, the fan, etc. is coupled to the engine and disposed in the front portion of the cab. Therefore, in order to enable the operator to see the top center portion of the blade from the cab, the size of the radiator needs to be somehow reduced so that the height of the cooling module is shortened. However, the radiator in the cooling module must maintain a certain size that is usually defined by the heat dissipation needs of the engine. Therefore, improving the front visibility of the bulldozer by reducing the size of the cooling module was not feasible. Thus, it has been the general understandings and expectations of the bulldozer operators that not being able to see the top center portion of the blade is the way it is.

6. Our new design of the bulldozer provides the solution to the above-mentioned problems that have been recognized but not solved for a long time in the bulldozer manufacturing field. Our new design is revolutionary in that it enables the operator to see the top center portion of the blade, which has been perceived as an unavoidable blind area for a long time. As shown in Figs. 1-1 and 1-2 of Exhibit A, the overall blade visibility is dramatically improved in the bulldozer of our new design. Also, as shown in Fig. 1-2, since the operator can see the top center portion of the blade, the operator can easily ascertain the angle of the blade. Moreover, as shown on page 5 of Exhibit A, the bulldozer of our new design exhibits improved accessibility and visibility to the objects placed on the ground as compared to the conventional bulldozers.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Masayuki Mukaino

Dated: Feb. 20'09

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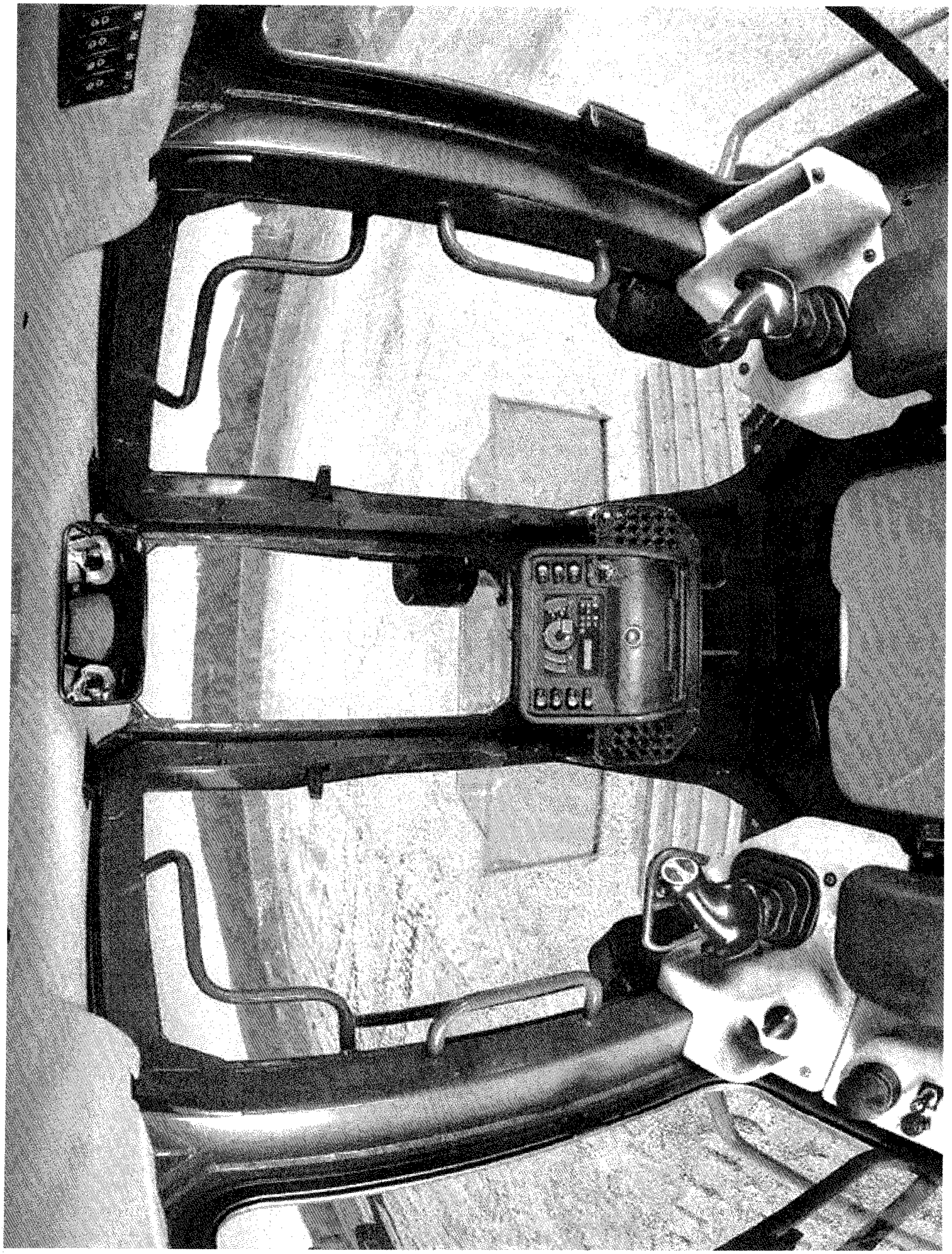
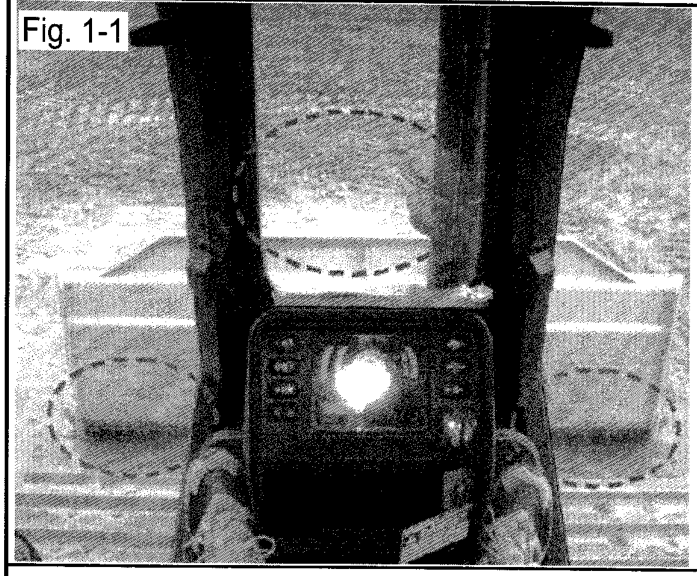
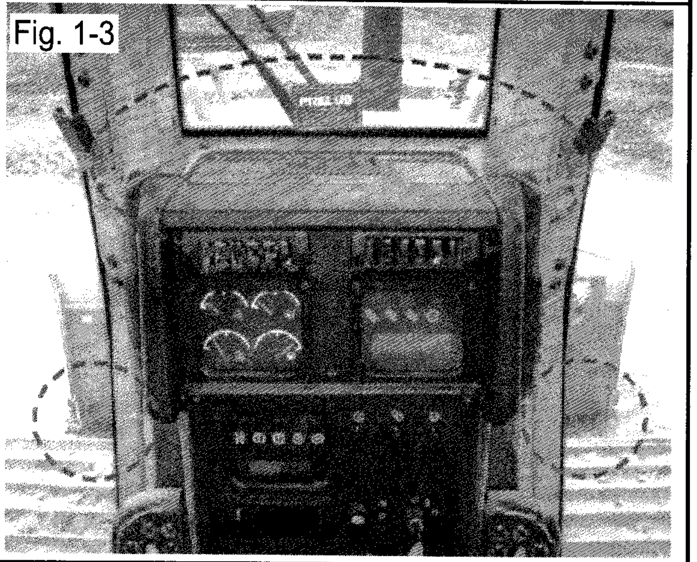
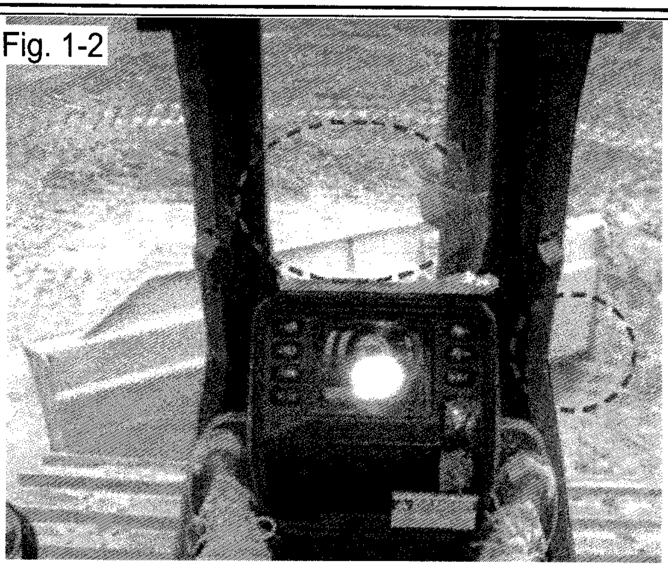
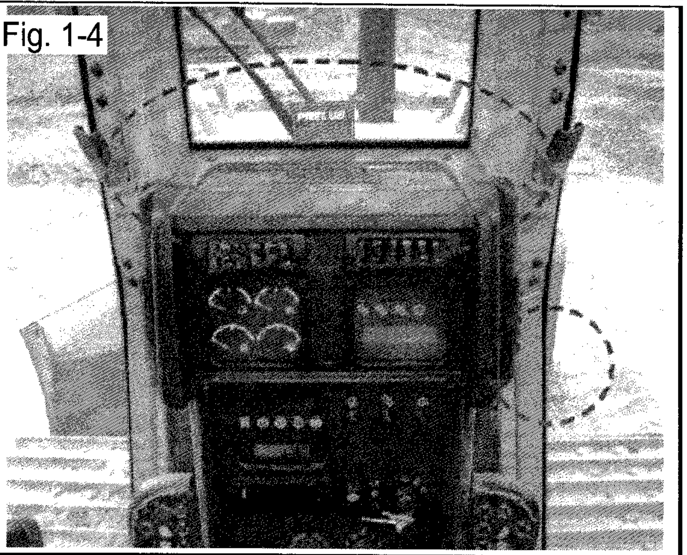
EXHIBIT A

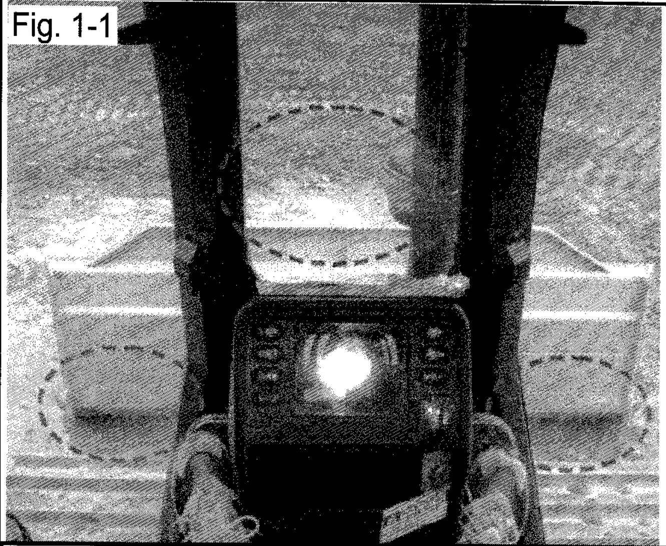
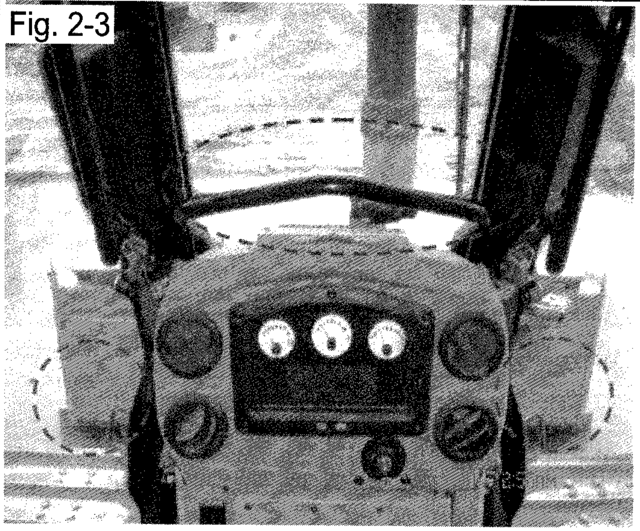
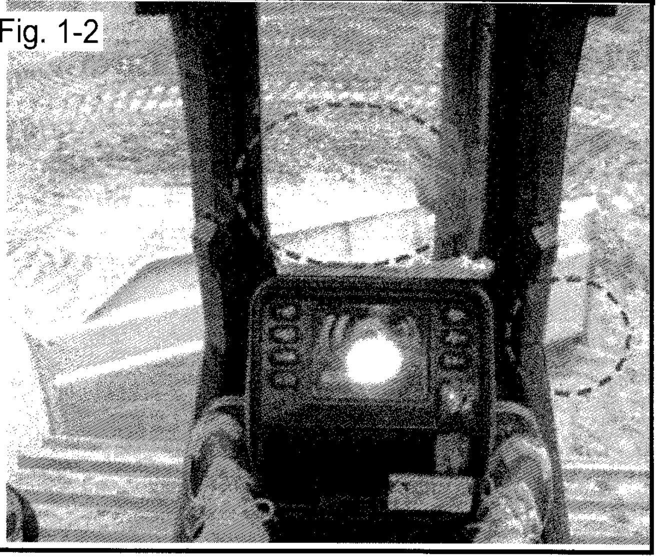
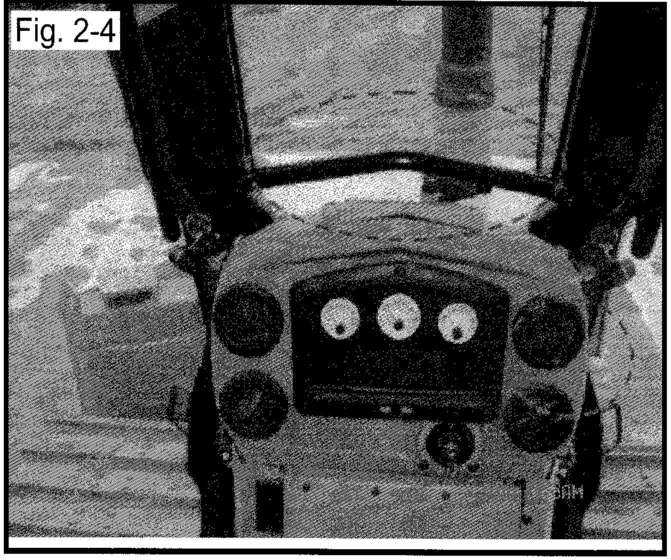
Komatsu D51-22



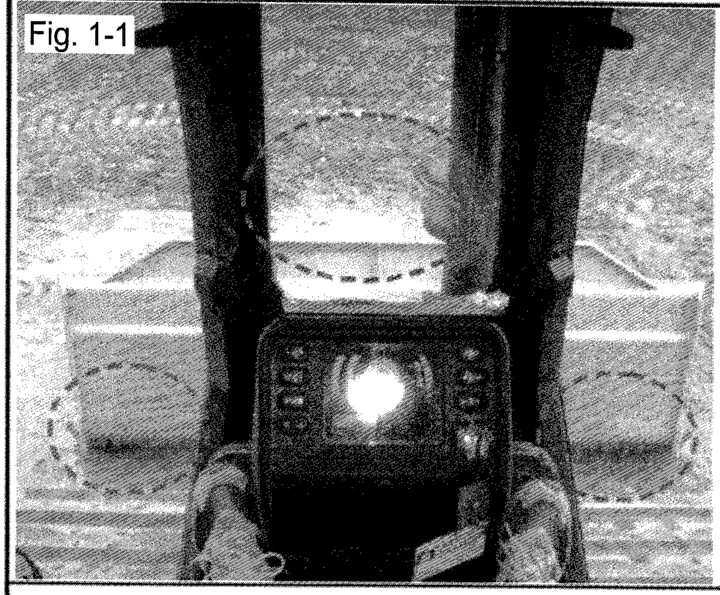
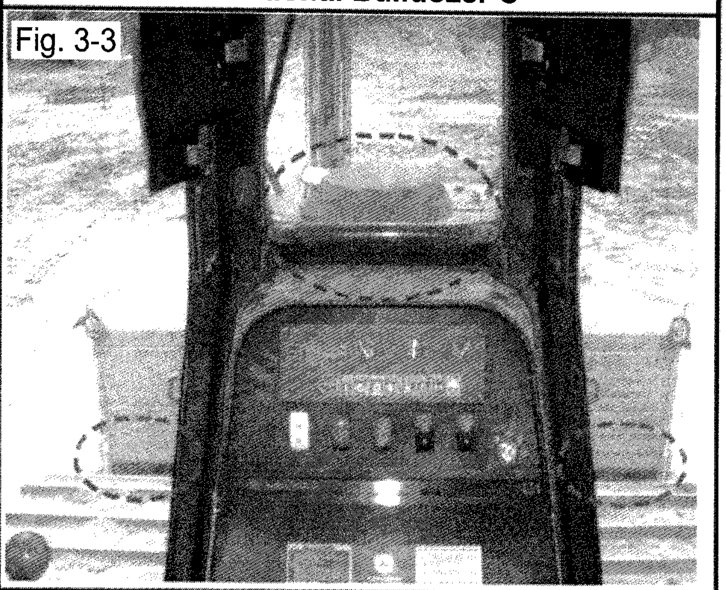
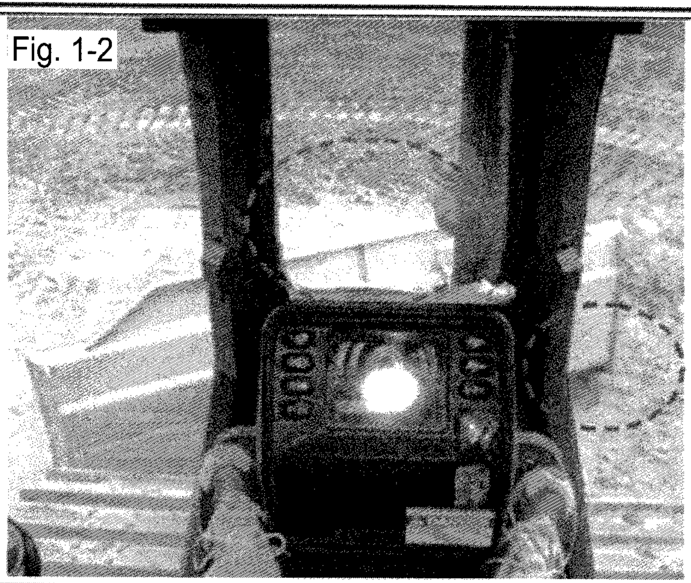
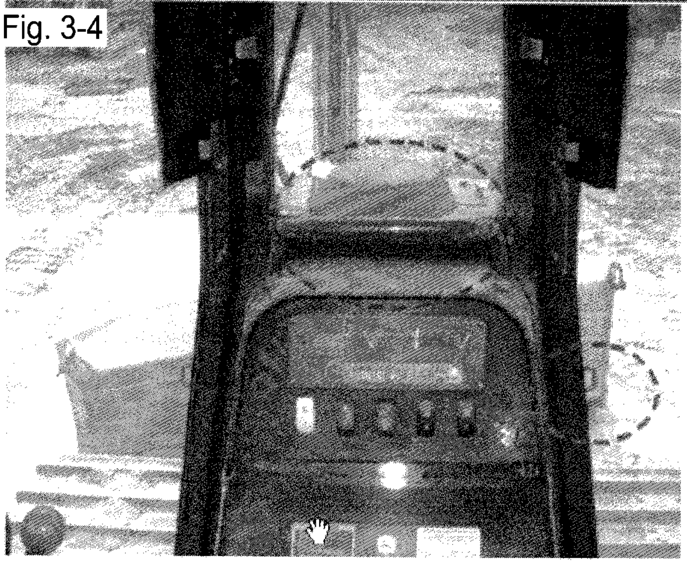
COMPARISON OF BLADE VISIBILITY (1)

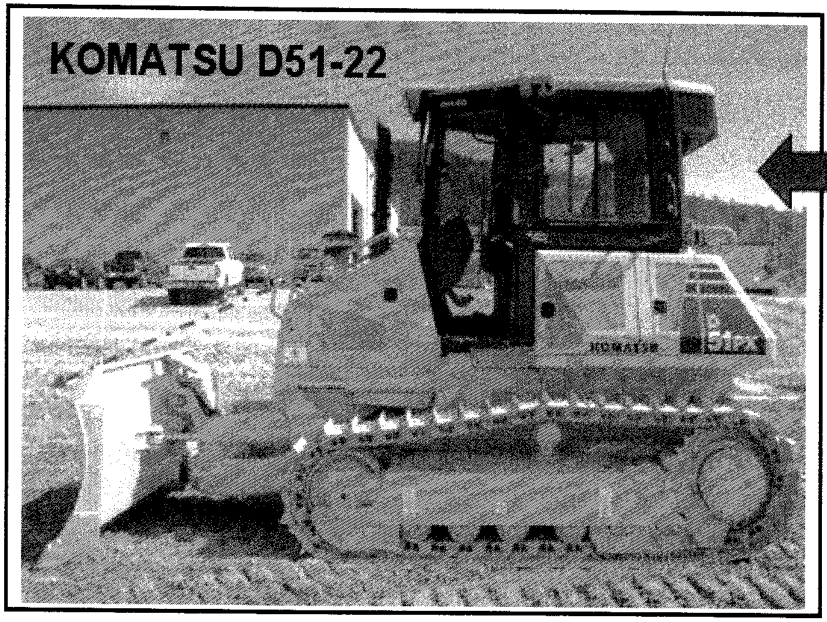
	Komatsu D51-22	Conventional Bulldozer A
Straight blade	Fig. 1-1  44%	Fig. 1-3  27%
Angled blade	Fig. 1-2  32%	Fig. 1-4  15%

COMPARISON OF BLADE VISIBILITY (2)

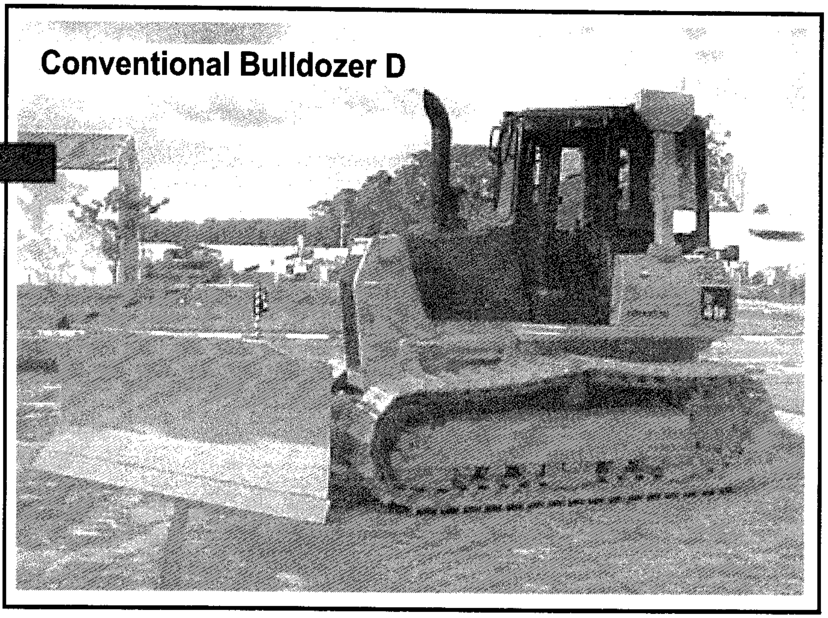
	Komatsu D51-22	Conventional Bulldozer B
Straight blade	Fig. 1-1 	Fig. 2-3 
Angled blade	Fig. 1-2 	Fig. 2-4 

COMPARISON OF BLADE VISIBILITY (3)

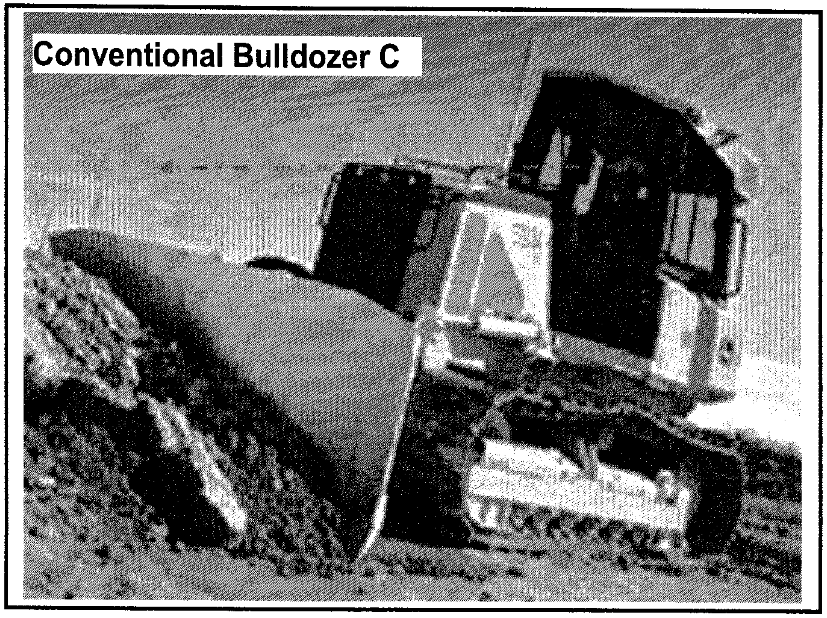
	Komatsu D51-22	Conventional Bulldozer C
Straight blade	 Fig. 1-1	 Fig. 3-3
	44%	35%
Angled blade	 Fig. 1-2	 Fig. 3-4
	32%	25%



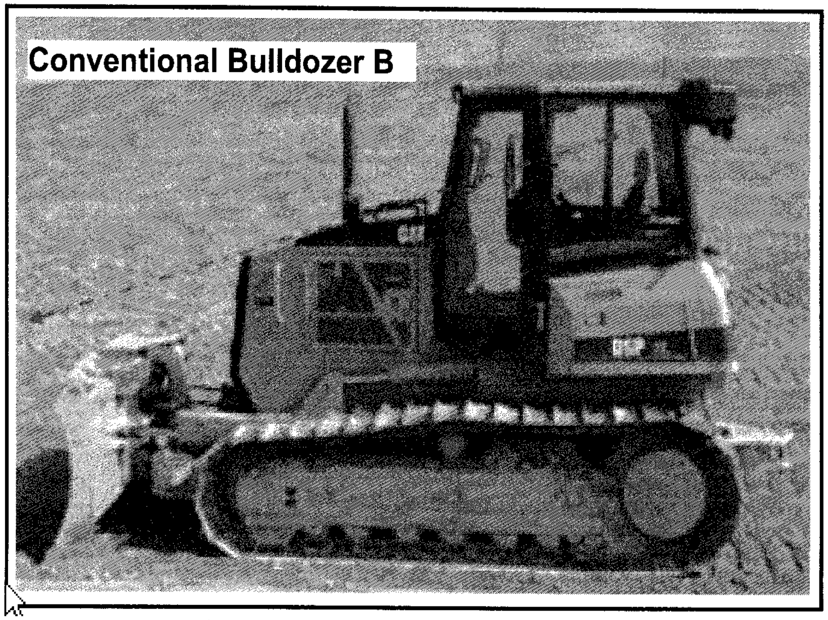
KOMATSU D51-22



Conventional Bulldozer D

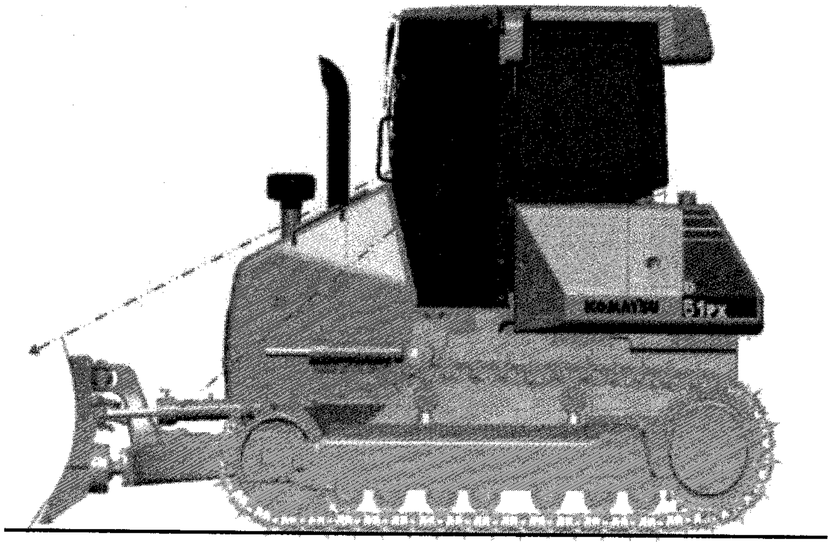


Conventional Bulldozer C

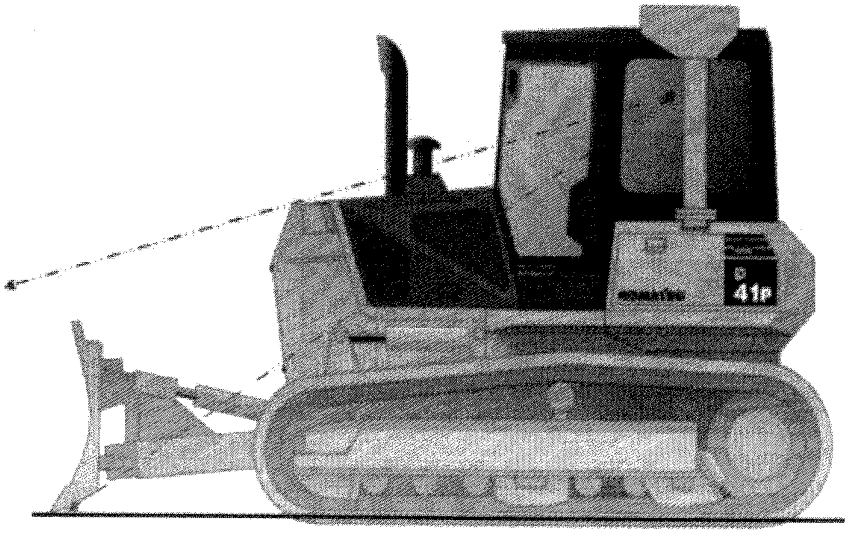


Conventional Bulldozer B

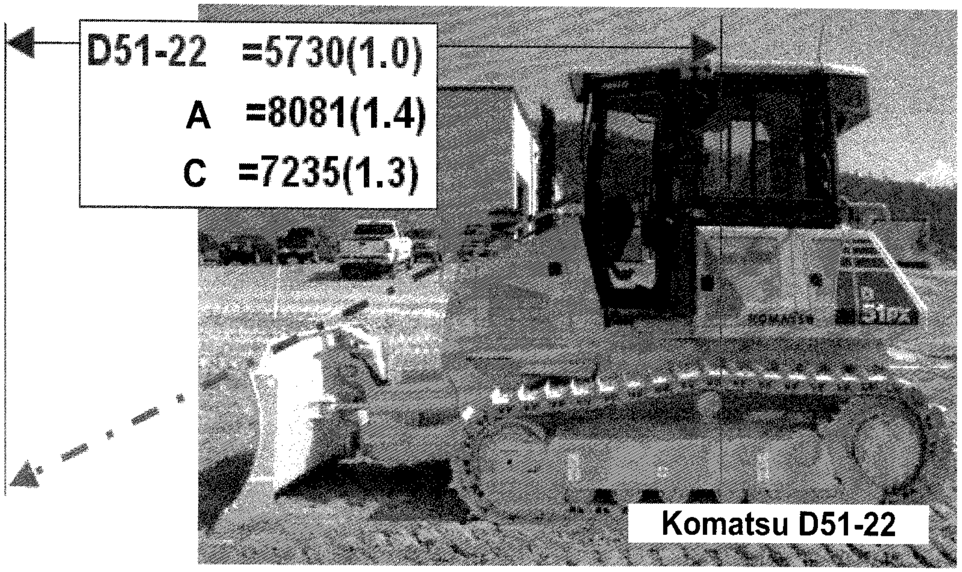
ACCESSIBILITY



Komatsu D51-22



Conventional Bulldozer D



Accessibility

	C distance(mm)
D51-22	320
D	1100
C	1555